AD NUMBER

AD872327

NEW LIMITATION CHANGE

TO

Approved for public release, distribution unlimited

FROM

Distribution authorized to U.S. Gov't. agencies and their contractors; Administrative/Operational Use; 26 May 1970. Other requests shall be referred to HQ U.S. Army Developmental Test Command, Aberdeen Proving Ground, MD 21005-5055.

AUTHORITY

USATEC ltr, 14 Dec 1970

U. S. ARMY TEST AND EVALUATION COMMAND
COMMODITY SERVICE TEST PROCEDURE

WARHEAD SECTION, ROCKET AND MISSILE

1. OBJECTIVE

The objective of this procedure is to describe tests used to determine the degree to which a rocket/missile warhead section meets the requirements of the QMR and to determine its overall suitability for field artillery use.

2. BACKGROUND

Field artillery has a continuing need for compact efficient warheads for combat use. These warheads must be reliable, easy to handle and use or be capable of being delivered with accuracy upon the target. Prior to this delivery on the target they must be capable of withstanding the effect of rough handling, cross-country transport and field storage. Additionally, they must be easy to prepare under blackout and adverse weather conditions.

3. REQUIRED EQUIPMENT

a. Unimproved and Improved Road Test Area.
b. Cross Country Test Area.
c. Organizational Shop Facility.
d. Mechanics Tool Set.
e. Photographic Equipment.
f. Scale and Measuring Equipment.
g. Stop Watches.
h. Complete Battalion or Battery (as appropriate) of the type to use the test item.
i. Hardstand Areas.
j. Firing Ranges.
k. Tactical Position Areas (assembly and simulated firing).
l. Handling Equipment.
m. Vehicles approved for transportation of the test item.
n. Instruments for Determining:

   1) Warhead event position
   2) MET data

o. Standard Rocket and Missile Sections to mate to warheads.
p. U. S. Weather Bureau Rain Gauge or Equivalent.

4. REFERENCES

A. USAMC Regulation 385-12, Verification of Safety of Materiel from Development Through Testing, Production, and Supply to Disposition.
B. USAMC Regulation 385-232, Shipping Criteria for Chemical Agents, Chemical Ammunition, Poisons, and Other Dangerous Articles.

UNCLASSIFIED
Security Classification

DOCUMENT CONTROL DATA - R & D

(Security classification of title, body of abstract and indexing annotation must be entered when the overall report is classified)

1. ORIGINATING ACTIVITY *(Corporate author)*
US Army Test and Evaluation Command (USATECOM)
Aberdeen Proving Ground, Maryland 21005

2a. REPORT SECURITY CLASSIFICATION
Unclassified

2b. GROUP
---

3. REPORT TITLE
U. S. Army Test and Evaluation Command Materiel Test Procedure 5-3-121, Commodity Service Test Procedure, - "Warhead Section, Rocket and Missile."

4. DESCRIPTIVE NOTES *(Type of report and inclusive dates)*
Final

5. AUTHOR(S) *(First name, middle initial, last name)*
---

6. REPORT DATE
26 May 1970

7a. TOTAL NO. OF PAGES
16

7b. NO. OF REFS
13

8a. CONTRACT OR GRANT NO.
DA-18-001-AMC-1045(R)

b. PROJECT NO.
AMCR 310-6

c.

d.

9a. ORIGINATOR'S REPORT NUMBER(S)
MTP 5-3-121

9b. OTHER REPORT NO(S) *(Any other numbers that may be assigned this report)*
---

10. DISTRIBUTION STATEMENT
This document is subject to special export controls and each transmittal to foreign governments or foreign nationals,-WITH THE EXCEPTION OF AUSTRALIA, CANADA, AND UNITED KINGDOM,-may be made only with prior approval of HQ,USATECOM.

11. SUPPLEMENTARY NOTES
---

12. SPONSORING MILITARY ACTIVITY
Headquarters
US Army Test and Evaluation Command
Aberdeen Proving Ground, Maryland 21005

13. ABSTRACT

This Army Service Test Procedure describes test methods and techniques for evaluating the performance and characteristics of Warhead Sections for Rocket/Missiles, and for determining their suitability for service use by the U. S. Army. The evaluation is related to criteria expressed in applicable Qualitative Materiel Requirements (QMR), Small Development Requirements (SDR), Technical Characteristics (TC), or other appropriate design requirements and specifications.

DD FORM 1 NOV 65 1473 (PAGE 1)
S/N 0101-807-6811

UNCLASSIFIED
Security Classification

A-31408

This MTP has been prepared for warhead sections which are separated from the remainder of the missile/rocket but can be used for warhead sections which are issued assembled to the missile/rocket by eliminating reference to mating and indicating warhead test points.

6. PROCEDURES

6.1 PREPARATION FOR TEST

6.1.1 Personnel Training

a. Ensure the availability of service personnel who have been trained using the criteria of MTP 10-3-501, in conjunction with the appropriate technical publications and training manuals of MTP 5-3-502, and are cognizant of the handling, maintaining, loading/unloading, mating, and safety hazard aspects of the test item and the object of the procedure.

b. Record the adequacy of the supplied training literature.

c. Record the following for all test personnel:

1) Rank
2) MOS
3) Experience in MOS
4) Training time in MOS

6.1.2 Pre-operational Inspection and Physical Characteristics

Determine the condition of the test item and verify its physical characteristics upon arrival at the test site by performing the applicable procedures as described in MTP 5-3-500 and the following:

a. Measure and record the center of gravity of the test item
b. Photograph the test item

6.1.3 Safety Release

Ensure that a Safety Release has been received from USATECOM Headquarters in accordance with USATECOM Regulation 385-6, and that its provisions and application it understood before proceeding with testing.

6.1.4 Scheduling

a. Schedule appropriate firing site and downrange area.

b. Schedule use of a field storage area for a period required by the QMR.

c. Schedule routes for transportability tests.

d. Schedule appropriate hardstand area and tactical areas for use of simulated assembly and firing sites.

6.2 TEST CONDUCT

6.2.1 Operational Suitability

6.2.1.1 Handling

Perform the following operations:

a. Remove the rocket/missile warhead from its shipping container and prepare it for tactical transport and handling.

NOTE: Handling equipment will be utilized as prescribed in accepted procedures outlined in training literature.

b. Load and off-load the warhead section a minimum of 10 times from each of the authorized means of transportation actuating and inspecting all buckles, straps, tiedowns and harnesses during the operation(s).

c. Record the time for the following:

1) Loading into each type transportation.
2) Unloading from each type transportation.
3) Movement by handling equipment from unloading area to check-out and mating area.

d. Record difficulties encountered.

e. Record leakage data, for bomblet type warheads, collected as described in paragraph 6.2.9.

6.2.1.2 Mating

Mate the warhead section to the missile/rocket a minimum of five times as described by the accepted procedures and record the following:

NOTE: Adoption kits will be used where appropriate.

a. Times for all mating exercises.

b. Any difficulties encountered.

c. Leakage data for bomblet type warheads, collected as described in paragraph 6.2.9.

6.2.1.3 Checkout, Repair, Replacement and Adjustment

a. Execute the following when authorized to be performed by the using unit:

1) Replacement of components
2) Repair of components
3) Adjustment of components
4) Checkout procedures

b. Record the following:

1) Time for checkout
2) Time for repair and replacement of various components
3) Time for component adjustments and adjustments made

4) Difficulties encountered

6.2.1.4 Adverse Conditions

Repeat the procedures of paragraphs 6.2.1.1 through 6.2.1.3 under blackout and extreme weather conditions a minimum of twice to determine the effect of adverse conditions on the test item operational suitability and record difficulties encountered due to the adverse conditions.

NOTE 1. Blackout conditions testing shall be performed using the guidelines of MTP 5-3-525.
2. Adverse weather conditions shall be considered as extremes of weather during the test period such as extremes of temperature and various forms of precipitation.

6.2.2. Transportability

NOTE: Perform this test in conjunction with unloading and loading and handling tests.

a. Transport the warhead section in accordance with specifications included within the QMR for the test item over the following:

1) Improved roads.
2) Unimproved roads.
3) Cross-country.

or for a total of 300 miles, should the quantitative requirements not be included within the QMR, as follows:

1) 250 miles over improved and unimproved roads
2) 50 miles over cross country terrain

b. Unless otherwise directed subject the test item to the applicable checkout procedures and visibly inspect for damage every fifty miles of transport to determine operability and physical damage incurred.

c. Record the following for each warhead tested:

1) Difficulties encountered during transport.
2) Damage incurred by the warhead and/or container.
3) Results of checkouts performed.
4) Efficiency of tiedowns and/or harness used.
5) Leakage data collected as described in paragraph 6.2.9, when applicable.

6.2.3 Firing Tests

6.2.3.1 Preparation for Tests

a. Install telemetry, when applicable, to determine fuze operation
b. Mate the test item to its appropriate missile or rocket

c. Prepare the missile or rocket for launch, including checkout.

6.2.3.2 Test Conduct

Fire the complete missile or rocket at short, medium, and long ranges, using each type fuze intended for use with the test warhead and perform the following:

NOTE: As many firings should be made as permitted by the allocation of the test items and standard missiles or rockets.

a. For all firings, record:

1) Date and time of day.
2) Relative humidity.
3) Wind direction and speed.
4) Ambient temperature.
5) Weather condition.
6) Firing data including launcher azimuth and elevation and target area range.
7) Warhead event position.
8) Determine and record accuracy of supplied firing tables.

b. For bomblet type warhead:

1) Record the impact location of each bomblet.
2) Record the location of warhead burst, both horizontally and vertically, with respect to firing point.
3) Plot the bomblet impact pattern in relation to center of target area to determine the miss distance.
4) Determine and record the preinitiation rate and dud rate, when possible.

c. For high explosive warheads:

1) Record the location of warhead burst, both horizontally and vertically.
2) Locate and record the center of the explosive (effects) pattern related to the center of the target to determine miss distance.
3) Determine and record the effect of the warhead burst on the target area.

6.2.4 Rain Test

Subject one warhead section while mated to a missile or rocket without benefit of protection of a shipping container or barrier bag (if so equipped) to a simulated rainfall of 2 inches, at the rate of one inch per hour, as measured by a U. S. Weather Bureau type gauge for 2 hours and then perform the following:

a. Subject the warhead section to a checkout and record results.
b. Disassemble the warhead section, to the extent authorized, visually examine it and record evidence of water leakage and/or damage.

6.2.5 Field Storage

Subject one warhead to the field storage conditions of MTP 5-3-527 and perform the following:

a. All normal maintenance
b. In-container checks at two week intervals or as directed and record results.
c. Leak test on bomblet type warheads at two week intervals and record data as described in paragraph 6.2.9.

6.2.6 Safety

NOTE: Observations shall be made continuously for any unsafe or potentially unsafe condition which may be cause for the cessation of testing. These unsafe or questionable conditions must be resolved in favor of safety before operations are resumed.

a. Determine and record data to verify the safety characteristics of the test item and to obtain information for Safety Confirmation throughout all tests.
b. Test personnel shall follow the safety procedures described in training literature and other pertinent publications.
c. Determine the test item safety hazards as described in the applicable sections of MTP 5-3-510 and the following:

1) Continuously observe for safety hazards during all tests
2) Record details of all safety hazards

6.2.7 Maintenance Evaluation

6.2.7.1 Maintainability

a. Determine the maintainability of the test item, while performing all scheduled and unscheduled organizational maintenance as described in the applicable sections of MTP 10-3-504 including the adequacy of the following maintenance package contents:

1) Allocation charts
2) Repair parts
3) Special tools
4) Draft copies of technical manuals

b. Record the following:

1) Difficult maintenance operations

2) Tools needed but not normally furnished
3) Maintenance performed but not prescribed

6.2.7.2 Reliability

Determine the reliability of the test item throughout testing as described in the applicable sections of MTP 10-3-512 and by recording the following:

a. All scheduled and unscheduled maintenance manhours and clock hours.
b. Types of malfunctions.
c. Time intervals between failures.
d. Cause(s) of failures, in known.
e. Failure component(s)

6.2.8 Human Factors Engineering

Determine and record the compatibility of the test item with service personnel who will operate and service it, with regard to their skills, aptitudes and physical limitations as described in the applicable sections of MTP 5-3-507.

6.2.9 Leak Testing (for Bomblet Type Warheads)

At a minimum of every two weeks and after each major operation of paragraph 6.2.1 inspect the test item, and its packing container, if applicable, and record the following:

a. Visable evidence of leakage

NOTE: Leakage may be in the form of a liquid, vapor, dry liquid stain or powdery exudate.

b. Evidence of damage, i.e., cracks, dents, broken components, etc.
c. Evidence of deterioration, i.e., corrosion, rust, etc.
d. Any other condition which may contribute to leakage

6.2.10 Value Analysis

During the conduct of all tests, the test personnel will observe for and record any unnecessary, costly, or nice-to-have features of the test item which can be eliminated without adversely affecting performance, operability or safety.

6.3 TEST DATA

6.3.1 Preparation for Test

6.3.1.1 Personnel Training

Record the following:

a. Adequacy of supplied training literature
b. For all test personnel:

1) Rank
2) Military Occupational Specialty (MOS)
3) Experience in MOS in months
4) Training time in MOS in months

6.3.1.2 Pre-operational Inspection and Physical Characteristics

a. Record data as described in MTP 5-3-500
b. Record the center of gravity of the test item
c. Retain all photographs

6.3.2 Test Conduct

6.3.2.1 Operational Suitability

6.3.2.1.1 Handling -

Record the following:

a. Test conditions (clear, rain, extreme cold, hot, etc.).
b. Record the following for each transporter used:

1) Times for loading onto transporter, in minutes.
2) Times for unloading from transporter, in minutes.
3) Number of times each transporter was loaded/unloaded (2,5,10, etc.).

c. Times for movement by handling equipment from unloading area to checkout area and mating area, in minutes.
d. Difficulties encountered.
e. Effect on weather on handling operations.
f. Leakage data collected as described in paragraph 6.2.9, when applicable.

6.3.2.1.2 Mating -

Record the following:

a. Test conditions (cold, hot, etc).
b. Time for mating, in minutes.
c. Adoption kit (used, not used).
d. Any difficulties encountered.
e. Number of mating operations (1, 3, 5, etc).
f. Effect of weather on mating.
g. Leakage data collected as described in paragraph 6.2.9, when applicable.

6.3.2.1.3 Checkout, Repair, Replacement and Adjustment

Record the following, as applicable:

a. Test conditions (rain, snow, etc)
b. Time required for checkout in minutes
c. Time required for replacement of components, in minutes and component replaced.
d. Time required for repair of components, in minutes, and component repaired.
e. Time required for component adjustment in minutes and component adjusted.
f. Difficulties encountered.
g. Effect of weather on operations.

6.3.2.2 Transportability

Record the following:

a. Difficulties encountered during transport.
b. Damage incurred by the warhead and/or container.
c. Results of checkouts.
d. Efficiency of tie-down or harness used for tie-down.
e. Leakage data collected as described in paragraph 6.2.9, when applicable.

6.3.2.3 Firing Tests

a. Record the following for all firings:

1) Time of firing in hour, day, month and year
2) Relative humidity in %
3) Wind direction (in degrees azimuth) and speed (in mph)
4) Ambient temperature in °F
5) Weather condition (clear, snow, rain, etc.)
6) Launcher azimuth in degrees
7) Launcher elevation in mils
8) Target area center range in meters
9) Warhead event position
10) Accuracy of firing tables

b. Record the following for bomblet type warheads:

1) Impact location of each bomblet
2) Preinitiation rate and dud rate, when possible
3) Location of warhead burst, from firing position, in meters:

a) Horizontally
b) Vertically

c. Retain the plot of bomblet impact location with respect to center

of target area.

d. Record the following for high explosive warheads:

1) Location of warhead burst, from firing position, in meters:

a) Horizontally
b) Vertically

2) Center of explosive pattern with respect to center of target area, in meters:

a) Above/below
b) Left/right

3) Effects of warhead burst on target area.

6.3.2.4 Rain Test

Record the following:

a. Results of warhead checkout
b. Evidence of water leakage and/or damage

6.3.2.5 Field Storage

Record the following for each check performed:

a. Storage time in weeks (2, 4, etc.)
b. Average ambient weather conditions during two weeks storage
c. Results of in-container check
d. Leakage data collected as described in paragraph 6.2.9

6.3.2.6 Safety

Record the following:

a. Data collected as described in the applicable sections of MTP 5-3-510.
b. Details of all safety hazards encountered.
c. Data collected for completion of safety confirmation.

6.3.2.7 Maintenance Evaluation

6.3.2.7.1 Maintainability -

Record the following:

a. Adequacy of:

1) Allocation charts
2) Repair parts

3) Special tools
4) Draft copies of technical manuals

b. Difficult maintenance operations
c. Tools needed but not normally furnished
d. Maintenance performed but not prescribed

6.3.2.7.2 Reliability -

Record the following:

a. Data collected as described in the applicable sections of MTP 10-3-512.
b. Man-hours and clock-hours required to perform:

1) Scheduled maintenance
2) Unscheduled maintenance

c. Types of malfunctions encountered.
d. Time intervals between failures, in operating hours.
e. Cause(s) of failures, if known.
f. Component(s) that fail.

6.3.2.8 Human Factors Engineering

Record data collected as described in the applicable sections of MTP 5-3-507.

6.3.2.9 Leak Testing

Record the following:

a. Date of test in day, month and year
b. Visible evidence of leakage
c. Evidence of damage (crack, dent, etc)
d. Evidence of deterioration (rust, corrosion, etc)
e. Other condition contributing to leakage (open weld, etc)

6.3.2.10 Value Analysis

Record the following:

a. Any features or components of the test item which could be eliminated.
b. Reason for recommendation of feature/component elimination.

6.4 DATA REDUCTION AND PRESENTATION

a. Chart or graph times recorded for loading, unloading, mating and maintaining (repair, replace, checkout and adjust) the test item under the various test conditions (daylight, blackout, adverse weather conditions

and summarize difficulties encountered.

b. Summarize the effect of the following tests on the test items electrical-electronic (checkout) and physical (leaks, cracks, dents, etc) condition:

1) Transport
2) Rain
3) Field storage

c. Present maintenance evaluation data as described in MTP 10-3-504 and MTP 10-3-512.

d. Summarize any recommendations for redesign due to human factors engineering.

e. Summarize any safety hazards and recommendations for corrections (if any) and make a presentation relating to Safety Confirmation in accordance with USATECOM Regulation 385-6.

f. Summarize inadequacy of training literature (if any).

THIS PAGE INTENTIONALLY LEFT BLANK

UNCLASSIFIED
Security Classification

DOCUMENT CONTROL DATA - R & D

(Security classification of title, body of abstract and indexing annotation must be entered when the overall report is classified)

1. ORIGINATING ACTIVITY *(Corporate author)*
US Army Test and Evaluation Command (USATECOM)
Aberdeen Proving Ground, Maryland 21005

2a. REPORT SECURITY CLASSIFICATION
Unclassified

2b. GROUP
---

3. REPORT TITLE
U. S. Army Test and Evaluation Command Materiel Test Procedure 5-3-121, Commodity Service Test Procedure, - "Warhead Section, Rocket and Missile."

4. DESCRIPTIVE NOTES *(Type of report and, inclusive dates)*
Final

5. AUTHOR(S) *(First name, middle initial, last name)*
---

6. REPORT DATE
26 May 1970

7a. TOTAL NO. OF PAGES
16

7b. NO. OF REFS
13

8a. CONTRACT OR GRANT NO.
DA-18-001-AMC-1045(R)

b. PROJECT NO.
AMCR 310-6

c.

d.

9a. ORIGINATOR'S REPORT NUMBER(S)
MTP 5-3-121

9b. OTHER REPORT NO(S) *(Any other numbers that may be assigned this report)*
---

10. DISTRIBUTION STATEMENT
This document is subject to special export controls and each transmittal to foreign governments or foreign nationals,-WITH THE EXCEPTION OF AUSTRALIA, CANADA, AND UNITED KINGDOM,-may be made only with prior approval of HQ,USATECOM.

11. SUPPLEMENTARY NOTES
---

12. SPONSORING MILITARY ACTIVITY
Headquarters
US Army Test and Evaluation Command
Aberdeen Proving Ground, Maryland 21005

13. ABSTRACT

This Army Service Test Procedure describes test methods and techniques for evaluating the performance and characteristics of Warhead Sections for Rocket/Missiles, and for determining their suitability for service use by the U. S. Army. The evaluation is related to criteria expressed in applicable Qualitative Materiel Requirements (QMR), Small Development Requirements (SDR), Technical Characteristics (TC), or other appropriate design requirements and specifications.

DD FORM 1 NOV 65 1473 (PAGE 1)
S/N 0101-807-6811

UNCLASSIFIED
Security Classification

A-31408

UNCLASSIFIED
Security Classification

14 KEY WORDS	LINK A		LINK B		LINK C	
	ROLE	WT	ROLE	WT	ROLE	WT
Army Service Test						
Warhead Section (Rocket and Missile)						
Test Procedures						
Test Methods and Techniques						

DD FORM 1 NOV 65 1473 (BACK)
S/N 0101-807-6821

UNCLASSIFIED
Security Classification

A-31409

FACSIMILE TRANSMITTAL HEADER SHEET

For use of this form, see AR 25-11; the proponent agency is ODISC4

COMMAND/ OFFICE	NAME/ OFFICE SYMBOL	OFFICE TELEPHONE NO. (AUTOVON/Comm.)	FAX NO. (AUTOVON/Comm.)
FROM: HQ DTC	Donna Benjamin CSTE-DTC-XO-I	410-278-1056 DSN 298-1056	410-278-7653 DSN 298-7653
TO: DTIC	Rosa Medley	703-767-8029	703-767-9244

CLASSIFICATION	PRECEDENCE	NO. PAGES (Including this Header)	DATE-TIME	MONTH	YEAR	RELEASER'S SIGNATURE
UUUU	RR	2	191555	FEB	04	

REMARKS

Rosa -- Hope this is the info you're looking for. Any questions, please let me know!

Space Below For Communications Center Use Only

Rosa --

Proponent for Test Operations Procedures (TOP's)/International Test Operations Procedures (ITOP's) (formerly Materiel Test Procedures (MTP's)) is the Technology Management Division, Directorate for Test and Technology, HQ DTC (formerly TECOM). POC is Mr. Dick Hayes (contractor), DSN 298-1478.

Proponent has reviewed the documents in question and provided the following updated distribution statements. Please note that the last two documents do not belong to HQ DTC.

Donna Benjamin
Information Services Team, Office of the Executive Officer
HQ, US Army Developmental Test Command
Aberdeen Proving Ground, MD 21005-5055

AD-867370	APPROVED FOR PUBLIC RELEASE
AD-870607	APPROVED FOR PUBLIC RELEASE
AD-872319	APPROVED FOR PUBLIC RELEASE
AD-868076	APPROVED FOR PUBLIC RELEASE
AD-872327	APPROVED FOR PUBLIC RELEASE
AD-866662	This document is subject to special export controls and each transmittal to foreign governments or foreign nationals -- with the exception of AUSTRALIA, CANADA, and UNITED KINGDOM -- may be made only with prior approval of HQ DTC (formerly USATECOM).
AD-867067	This document is subject to special export controls and each transmittal to foreign governments or foreign nationals -- with the exception of AUSTRALIA, CANADA, and UNITED KINGDOM -- may be made only with prior approval of HQ DTC (formerly USATECOM).
AD-869898	This document is subject to special export controls and each transmittal to foreign governments or foreign nationals -- with the exception of AUSTRALIA, CANADA, and UNITED KINGDOM -- may be made only with prior approval of HQ DTC (formerly USATECOM).
AD-872678	APPROVED FOR PUBLIC RELEASE
AD-875688	APPROVED FOR PUBLIC RELEASE
ADA107579	APPROVED FOR PUBLIC RELEASE
AD-843586	This document does not belong to HQ DTC.
ADA121347	This document does not belong to HQ DTC.